

there is scarcely any thing by which science can be more truly benefited than by researches directed expressly to this object, and to the construction of tables exhibiting the true numerical relations of the elements of theories, and the actual state of nature, in all its different branches. It is only by such determinations that we can ascertain what changes are slowly and imperceptibly taking place in the existing order of things; and the more accurate they are, the *sooner* will this knowledge be acquired. What might we not now have known of the motions of the (so-called) fixed stars, had the ancients possessed the means of observation we now possess, and employed them as we employ them now?

(387.) In any enumeration of causes which have contributed to the recent rapid advancement of science, we must not forget the very important one of improved and constantly improving means of observation, both in instruments adapted for the exact measurement of quantity, and in the general convenience and well-judged adaptation to its purposes, of every description of scientific apparatus. In the actual state of science there are few observations which can be productive of any great advantage but such as afford accurate measurement; and an increased refinement in this respect is constantly called for. The degree of delicacy actually attained, we will not say in the most elaborate works of the highest art, but in such ordinary apparatus as every observer may now command, is such as could not have been arrived at unless in a state of the mechanical arts, which in its turn (such is the mutual re-action of cause and effect) requires for its existence a very advanced state of science. What an important influence may be exercised over the progress of a single branch of science by the invention of a ready and convenient mode of executing a definite measurement, and the construction and common introduction of an instrument adapted for it, cannot be better exemplified than by the instance of the reflecting goniometer. This simple, cheap, and portable little instrument